

2.10 Noise

The proposed project is classified as a Type III project, as determined by the California Department of Transportation (Caltrans) Noise Policy Protocol for traffic noise studies. Because the project is not a Type I or II project as defined by 23 Code of Federal Regulations (CFR) 772, a noise analysis is not required. For the reasons stated above, the regulatory setting under Section 2.10.1 is provided for information purposes.

2.10.1 Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

2.10.1.1 California Environmental Quality Act

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section will focus on the NEPA/23 CFR 772 noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

2.10.1.2 National Environmental Policy Act and 23 CFR 772

For highway transportation projects with Federal Highway Administration (FHWA) involvement (and Caltrans, as assigned), the Federal-Aid Highway Act of 1970 and its implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 A-weighted decibels [dBA]) is lower than the NAC for commercial areas (72 dBA). Table 2.10.1 lists the noise abatement criteria for use in the NEPA 23 CFR 772 analysis.

Table 2.10.1 Noise Abatement Criteria

Activity Category	NAC, Hourly A-Weighted Noise Level, dBA $L_{eq}(h)$	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B ¹	67 (Exterior)	Residential.
C ¹	67 (Exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, daycare centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.

Source: California Department of Transportation *Standard Environmental Reference* (August 2017).

¹ Includes undeveloped lands permitted for this activity category.

dBA = A-weighted decibels

$L_{eq}(h)$ = one-hour A-weighted equivalent continuous noise level

NAC = Noise Abatement Criteria

NEPA = National Environmental Policy Act

Table 2.10.2 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

Table 2.10.2 Noise Levels of Common Activities

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
Jet Fly-over at 300m (1000 ft)	110	Rock Band
Gas Lawn Mower at 1 m (3 ft)	100	
Diesel Truck at 15 m (50 ft), at 80 km (50 mph)	90	Food Blender at 1 m (3 ft)
Noisy Urban Area, Daytime	80	Garbage Disposal at 1 m (3 ft)
Gas Lawn Mower, 30 m (100 ft)	70	Vacuum Cleaner at 3 m (10 ft)
Commercial Area		Normal Speech at 1 m (3 ft)
Heavy Traffic at 90 m (300 ft)	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	30	Library
Quiet Rural Nighttime	20	Bedroom at Night, Concert Hall (Background)
	10	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	0	Lowest Threshold of Human Hearing

Source: California Department of Transportation *Standard Environmental Reference* (August 2017).

dBA = A-weighted decibels

ft = foot/feet

m = meter(s)

mph = miles per hour

According to Caltrans' *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects* (Traffic Noise Analysis Protocol) (May 2011), a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project

plans and specifications. This document discusses noise abatement measures that would likely be incorporated into the project.

Caltrans' Traffic Noise Analysis Protocol (2011) sets forth the criteria for determining when an abatement measure is feasible and reasonable. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. In addition, a minimum 7 dBA reduction in future noise levels must be achieved at one or more benefited receptor for an abatement measure to be considered reasonable. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include residents' acceptance and the cost per benefited residence.

2.10.2 Affected Environment

2.10.2.1 Surrounding Land Use and Receptors

Land uses within the project area include undeveloped vacant land and parkland, including Ronald W. Caspers Wilderness Park and Cleveland National Forest, as well as the San Juan Fire Station. The San Juan Fire Station is located approximately 70 feet (ft) to the north of State Route 74 (SR-74) in the project area. With the exception of the fire station, there are generally no areas of frequent human use or other sensitive receptors in the immediate vicinity of the SR-74 roadway.

2.10.3 Environmental Consequences

2.10.3.1 Temporary Impacts

Build Alternative (Preferred Alternative)

Two types of short-term noise effects would occur during construction of the proposed project. The first type would be from construction crew commutes and the transport of construction equipment and materials to the study area and would incrementally raise noise levels on access roads leading to the site. The pieces of heavy equipment for grading and construction activities would be moved on site, would remain for the duration of each construction phase, and would not add to the daily traffic volume in the project vicinity. A high single-event noise exposure potential at a maximum level of 84 dBA maximum instantaneous sound level (L_{\max}) from trucks passing at 50 ft would exist. However, the projected construction traffic would be minimal when compared to existing traffic volumes on SR-74 and other affected streets would not be perceptible. Therefore, short-term construction-related

worker commutes and equipment transport noise impacts would be less than substantial.

The second type of short-term noise impact is related to noise generated during project construction. Construction is performed in discrete steps, each having its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases will change the character of the noise generated, as well as the noise levels in the study area as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction-related noise ranges to be categorized by work phase. Table 2.10.3 lists typical construction equipment noise levels (L_{\max}) recommended for noise impact assessments based on a distance of 50 ft between the equipment and a noise receptor.

Table 2.10.3 Typical Construction Equipment Noise Levels

Equipment Description	Maximum Noise Level (L_{\max}) at 50 Feet¹
Backhoes	80
Compactor (ground)	80
Cranes	85
Dozers	85
Dump Trucks	84
Excavators	85
Flat Bed Trucks	84
Front-end Loaders	80
Graders	85
Impact Pile Drivers	95
Jackhammers	85
Pick-up Truck	55
Pneumatic Tools	85
Pumps	77
Rock Drills	85
Rollers	85
Scrapers	85
Tractors	84

Source: Federal Highway Administration. *Roadway Construction Noise Model* (January 2006).

Note: Noise levels reported in this table are rounded to the nearest whole number.

¹ Maximum noise levels were developed based on Spec 721.560 from the Central Artery/Tunnel (CA/T) program to be consistent with the City of Boston's Noise Code for the "Big Dig" project.

L_{\max} = maximum instantaneous sound level

Normal construction operations, specifically during the site preparation phase that includes excavation and grading, may generate high noise levels from an active construction area. Earthmoving equipment includes excavating machinery such as backfillers, bulldozers, and front-end loaders. Earthmoving and compacting equipment includes compactors, scrapers, and graders.

The construction of the proposed project is expected to require the use of scrapers, bulldozers, and water trucks/pickup trucks. Noise associated with the use of construction equipment is estimated between 55 and 85 dBA L_{max} at a distance of 50 ft from the active construction area for the grading phase. As seen in Table 2.10.3, the maximum noise level generated by each scraper is assumed to be approximately 85 dBA L_{max} at 50 ft from the scraper in operation. Each bulldozer would generate approximately 85 dBA L_{max} at 50 ft. The maximum noise level generated by water trucks/pickup trucks is approximately 55 dBA L_{max} at 50 ft from these vehicles. Each doubling of the sound source with equal strength increases the noise level by 3 dBA. Each piece of construction equipment operates as an individual point source. The worst-case composite noise level at the nearest residence during this phase of construction would be 88 dBA L_{max} (at a distance of 50 ft from an active construction area).

The closest receptor is the San Juan Fire Station, which is located approximately 70 ft north of SR-74 and may be subject to a short-term noise level of 88 dBA L_{max} generated by construction activities along the project alignment. Project Feature PF-N-1, as outlined below, will ensure compliance with Caltrans' Standard Specifications Section 14-8.02 (Caltrans 2015) and will be required to minimize construction noise impacts on sensitive land uses adjacent to the project site.

PF-N-1 The nighttime noise level from the construction contractor's operations, between the hours of 9:00 p.m. and 6:00 a.m., will not exceed 86 A-weighted decibels (dBA) at a distance of 50 feet. In addition, the construction contractor will equip all internal combustion engines with a manufacturer-recommended muffler and will not operate any internal combustion engine on the job site without the appropriate muffler.

Through implementation of this standard feature, short-term construction noise impacts would be minimized.

No Build Alternative

No construction activities would occur under the No Build Alternative. Therefore, no short-term construction noise impacts would result.

2.10.3.2 Permanent Impacts

Build Alternative (Preferred Alternative)

The proposed project is classified as a Type III project. Because the project is not a Type I or II project as defined by 23 CFR 772, a noise analysis is not required. Type I projects include: construction of a new highway on a new location, substantially physically altering either horizontally or vertically an existing highway, adding through-traffic lanes, auxiliary lanes, or completing an existing partial interchange, and addition or substantially altering a weigh station, rest stop, ride-share lot, or toll plaza. A Type II project involves construction of noise abatement on an existing highway with no changes to highway capacity or alignment.

No Build Alternative

No improvements to SR-74 would be made other than routine roadway maintenance. Noise-sensitive receptors located within the project area would not be exposed to a new traffic noise impact.

2.10.4 Avoidance, Minimization, and/or Mitigation Measures

Because the project would incorporate Project Feature PF-N-1, described above in Section 2.10.3, as well as other provisions outlined in the standard specifications to avoid and minimize construction noise impacts, no additional avoidance, minimization, and/or mitigation measures would be necessary.

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